

Application No.: 10/008,944
Amendment dated: January 19, 2004
Reply to Office Action of October 9, 2003

c.) Remarks

Claims 1-32 are pending in this application. Claims 1, 7, 9, 17, 19, 20, and 23-26 have been amended in various particulars as indicated hereinabove. New Claims 27 through 32 have been added to alternatively define Applicant's invention.

Generally, the application, including the claims, has been generally reviewed for grammar. Also, in a number of instances, the claim scope was adjusted to render the claims broader.

Turning now to the merits, the present invention is directed to a cooling apparatus for a laser head, such as in an imaging system. In the preferred embodiment, this imaging system is deployed in an imagesetter or platesetter. These are commercial or industrial machines that are used to create the plates used in offset printing operations. Typically, the plates or film are imaged using this laser head so that ink will selectively adhere to the printing plate when installed in the offset printing press.

Because of the commercial nature of these machines, their value is often related to their throughput. And, the throughput or time to image a substrate is often limited by the power that can be obtained from the imaging head laser and transmitted to the imageable medium, such as the plate. As a result, the designs must typically optimize this power. And if a modulator is used, such as a light valve, the modulator must further handle these high power levels.

Another factor in the commercial viability of these machines is their cost. There is always a continuing effort to reduce component costs in their construction.

The present invention is directed to addressing these engineering and economic constraints. The invention concerns an apparatus that can cool a power supply, laser source, and light valve light modulator. This cooling apparatus is required to remove heat from these devices, allowing them to run at higher power, without being damaged.

To address the component cost of the overall system, the coolant from a cooling unit is used to provide cooling fluid to laser source, laser power supply, and light valve.

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This is achieved, while accommodating these devices different cooling requirements, by providing first and second parallel supply branches. The laser source is connected to one supply branch and the power supply and the light valve device are connected to the other supply branch.

Claims 1-23 were rejected under 35 U.S.C. § 103(a) as being unpatentable over U.S. Pat. No. 5,848,081 to Reed, *et al.* in view of U.S. Pat. No. 5,572,538 to Saitoh, *et al.*, U.S. Pat. No. 6,007,205 to Fugimori, and U.S. Pat. No. 5,327,442 to Yarborough, *et al.* This rejection is respectfully traversed for the following reasons.

Each of the claims, including new claim 27, is directed to a system (apparatus) or method in which coolant liquid, from a source or unit, is conveyed to a laser in one branch and a laser power supply and light valve in another branch. As discussed hereinabove, the relevance of this claimed configuration is that heat can be removed from these typically high power sources, power supplies and light valves to prevent their overheating and possible damage. The cooling fluid is supplied from a common cooling unit as described in claim 27, for example, providing a possibly low cost configuration by avoiding the need for multiple cooling units.

None of the applied references, either separately or in combination, shows nor suggests this invention. They further fail to appreciate the problems confronted in these imaging systems where heat in a laser source, laser power supply, and light valve must be managed. They do not even address a configuration in which coolant is used for a light valve and laser source.

For example, the reference that mentions light valve systems is the Fugimori patent. There, a fan is used to generate air flow to cool the light valve array. The Reed, *et al.* patent, for example, is directed to flashlamp systems; and the Yarborough, *et al.* patent is directed to a laser head cooling in which the gain medium and the optical pumping assembly are together cooled.

In short, none of the applied references provides that a single cooling unit should be used to cool the laser source, power supply and light valve. Moreover, none of the

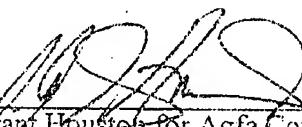
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references shows or suggests that the cooling of these three components should be achieved using two supply branches from the same cooling unit.

Thus, Applicant respectfully believes that the present claims are patentably distinguishable over the applied references. Withdrawal of the rejection is respectfully requested.

Applicant believes that the present application is in condition for allowance. A Notice of Allowance is respectfully solicited. Should any questions arise, the Examiner is encouraged to contact the undersigned.

Respectfully submitted,

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